THE SERVANT IN THE HOUSE:

A BRIEF HISTORY OF THE SEWING MACHINE

BY

FREDERICK L. LEWTON

Curator, Division of Textiles, United States National Museum

FROM THE SMITHSONIAN REPORT FOR 1929, PAGES 559–583
(WITH 8 PLATES)

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[With 8 plates]

The Song of the Shirt

With fingers weary and worn,
  With eyelids heavy and red,
A woman sat, in unwomanly rags,
  Plying her needle and thread,—
Stitch! stitch! stitch!
  In poverty, hunger, and dirt;
And still with a voice of dolorous pitch—
  Would that its tone could reach the rich!—
She sang this "Song of the Shirt!"

—Thomas Hood.

WHY THE SEWING MACHINE WAS INVENTED

The sewing machine, like most important inventions, was the result of the needs of its time and was thought out and brought into practical reality when the demand became acute for more speed and increased production in the manufacture of garments. The poverty of England's seamstresses as told in Hood's The Song of the Shirt, the need of uniforms for clothing the army in France, and the periodically sudden needs for garments by the whale fishermen of New Bedford and other New England fishing ports, all were reflected in attempts to improve upon sewing by hand. When these various attempts did appear they attracted but little attention at first except from those who feared their means of earning a living would be taken from them if a machine to sew would become a possibility. The machines of Barthelemy Thimonnier engaged in sewing uniforms for the army in France were destroyed by a mob, and the development of what promised to be America's first practical machine (that of Walter Hunt in 1834) was laid aside for fear of taking the bread out of the mouths of the seamstresses.

Even though sewing machines formed one of the most interesting exhibits at the "great exhibition" in the Crystal Palace at London

in 1851, the important part they were to play in the life of the people of the whole world was so little appreciated that no mention was made of them in the long list of achievements discussed by writers of the time. A series of reviews and essays under the general title of Gifts of Science to Industry, which appeared in the London Times during the progress of the "great exhibition" in 1851, discuss the outstanding achievements of the times as shown at the exhibition but make no mention of the sewing machine.

While the first idea of a sewing machine appeared in England the credit for producing the first practical machine belongs to Americans. The possibility of sewing by machinery was practically demonstrated over 100 years ago; but it required the combined efforts of a generation of inventors to improve the sewing machine so as to make it really a labor-saving instrument. Its history is a record of rapid advancement in mechanical movements and combinations of devices, which had apparently never been thought of until the close of the eighteenth century. While a great many people have contributed, by their powers of invention, to the present perfection of the sewing machine, and are therefore entitled to due honor and praise for the results of these labors, still the names of Thomas Saint, Barthelemy Thimonnier, Walter Hunt, Elias Howe, jr., Allen B. Wilson, Isaac Merrit Singer, and James E. A. Gibbs, must always be recognized as those of men in whose minds the idea of a sewing machine was first conceived in anything like the form in which it has been preserved until now, and whose early crude productions contained any of those features that have been found to be essential after so many years of improvement and progress.

The fascinating story of the invention of this most useful household servant is best told by revealing a few incidents in the lives of several of these great inventive geniuses who contributed most to make machine sewing practicable. Thimonnier, Hunt, Howe, Wilson, Singer, and Gibbs—among the thousands who have spent months and years of effort to improve upon the hand method of sewing, these six stand out as shining stars of great brilliance in a firmament already bright with hosts of others.

THOMAS SAINT

The idea of a machine that would use a needle and thread for the purpose of sewing together two or more pieces of cloth or leather after the manner in which this had been done by human hands for thousands of years appears to have been first thought out by an Englishman, Thomas Saint, who in 1790 received a patent for a machine for sewing leather. His drawings show certain features which are essential to the sewing machines used to-day, but so far as known Saint's idea was not put to any practical use by him.

BARTHELEMY THIMONNIER

Thirty-five years later, a poor French tailor, entirely ignorant of the principles of mechanics, became so absorbed with the idea of producing a machine to sew the seams of garments, that he spent four years endeavoring to make it sew, only working at his trade enough to obtain for his family the barest necessities of life. He worked alone and in secret and so neglected his business that he was looked upon as little more than crazy. By 1829 he had mastered the mechanical difficulties and had produced a sewing machine which made the chain stitch by means of a hooked needle like a crochet needle. The next year he was given a patent on his machine and soon attracted the attention of a skillful engineer who took Thimonnier and his machine to Paris. By 1831 he had made so much progress that he was made a member of a prominent clothing firm and had 80 of his sewing machines at work upon uniforms for the French troops. But the tailors looked upon the new invention as a dangerous competition and an infuriated mob smashed every machine they could find, forcing the inventor to flee for his life. We see poor Thimonnier trudging homeward from Paris with his sewing machine on his back and exhibiting it as a curiosity for a living. Later he tried to provide for his family by selling handmade wooden machines for $10 each. He kept on trying to perfect his machine and by 1845 he had so improved it that he was able to sew at the rate of 200 stitches per minute. At this time he obtained the help of a friend named Magnin to manufacture the machines, and he soon had a machine capable of sewing all kinds of fabrics from fine muslin to leather. The revolution of 1848 put a stop to his sewing-machine business and Thimonnier went to England for a short time. Together with Magnin he secured a patent for his machine in England in 1849 and the next year the United States granted him one, but by this time other inventors had entered the field with more practical machines.

Thimonnier sent his machine to the Universal Exhibition in London in 1851, but through a mistake it was not seen by the judges and no attention was paid to it. This greatly discouraged him and although he continued to work with his machine for a few years his lifelong struggle had exhausted him and he died in poverty in 1857, aged 64 years. When we see Thimonnier's lifelong effort and bitter struggles continued in spite of so many failures, we must believe that the man was possessed of more than an ordinary share of energy and perseverance, and that his failure to popularize his machine was due to the times in which he lived and the people among whom he sought to introduce it. In one sense his life was a total failure, for he reaped none of the wealth which was showered upon many of the pioneers in the sewing-machine trade; but before he died he had the realization

of his lifelong dream—that of seeing the sewing machine recognized as one of the most efficient labor-saving inventions of our civilization and its manufacture and sale a prosperous business.

WALTER HUNT

About the time that Thimonnier had so developed his invention that 80 of his machines were sewing for the French Army, an inventive Quaker genius in New York City was turning his attention to a sewing machine. This man, Walter Huut, was then 39 years old and already had to his credit a number of useful inventions such as a flax-spinning machine, a knife sharpener, gong bells, a yarn twister, the first stove to burn hard coal, etc. From 1835 to the year 1859, when he died, Hunt had invented a greater number and a greater diversity of fundamental original ideas than any known man of his time, which in their original or some modified form are in use to-day. Among his inventions of this period were the following: Machinery for making nails and rivets, ice plows, velocipedes, a revolver, a repeating rifle, metallic cartridges, conical bullets, paraffin candles, a street-sweeping machine, a student lamp, paper collars, and the safety pins which mothers find so indispensable in the nursery. His friend J. R. Chapin, a draughtsman, who prepared many drawings to accompany Hunt's application for patents, says of the safety pin, that it was thought out, a model made of an old piece of wire, and the idea sold for $400, all within the space of three hours, in order to pay a debt of $15 which Hunt owed him.

In addition to possessing a marvelously original and inventive turn of mind, Hunt was a diligent student and had an extensive acquaintance with the mechanical and scientific literature of his time. Somewhere between the years 1832 and 1834, Walter Hunt made in his shop on Amos Street, New York City, a machine "for sewing, stitching, and seaming cloth." This first machine was quite successful, so that others like it were built by the inventor assisted by his brother, Adoniram.

Many samples of cloth were sewn by these machines, and friends and neighbors of the inventor came to see them work. While Hunt's machine could not be made to do curved or angular work, nor sew a continuous seam for more than a few inches without removing and readjusting the cloth, it was capable of doing certain classes of work with speed and accuracy and to that extent must be regarded as a practical success, even though it was still incapable of the general adaptation which sewing machines afterwards attained. Walter Hunt's invention, however, contained nearly all the essential parts of the best modern machines. He used an eye-pointed needle, moved by a vibrating arm, working in combination with a shuttle carrying a second thread so as to make an interlocked stitch fully as well as

it is done by our present improved machines. The cloth feed was no doubt imperfect, which thus made the machine of little practical value, but for all that it was a step in the right direction, and was undoubtedly the pioneer of the present sewing machine, and far in advance of anything which had been done before it.

In 1834, Hunt had sold a half interest in his machine to George A. Arrowsmith, a blacksmith, who conducted the Globe Stove Works on Gold Street, New York City, and was the employer of Walter Hunt's brother, Adoniram F. Hunt. At the request of Arrowsmith, Adoniram built a second machine of wood according to Walter's plans which so impressed Arrowsmith with its value that he bought the other half interest in the invention from Walter Hunt, with the intention of developing it, Hunt agreeing to assist him in preparing drawings for the securing of a patent. Financial difficulties, the opposition on religious and moral grounds of friends of the hosts of hand sewers, who would thus be deprived of a means of livelihood, and the realization of the size of the undertaking comprised in manufacturing and selling such a machine, discouraged Arrowsmith from doing anything with his purchase from Hunt. In the meantime, in 1835, Arrowsmith, who had business interests in Baltimore, sent Adoniram Hunt there. Adoniram took with him his sewing machine and demonstrated it to his friend, Joel Johnson, with whom he was staying. The next year he writes to Johnson: "I made that sewing machine that I had at your house work to a charm," and adds that he desires to build a stronger machine, all of iron.

In 1838, Walter Hunt suggested to his daughter Caroline, then a girl about 15 years of age, that she engage in the business of manufacturing corsets with the aid of the sewing machine made by him. After discussing the matter with older women, experienced in the business, Miss Caroline declined to go into the business and use the new invention to perform the difficult heavy stitching required, for the sole reason that the introduction of such a machine would be injurious to the interests of hand sewers, and would be very unpopular.

The invention appears to have dropped completely out of sight until the successful introduction of sewing machines drew attention to it some 15 years later, when a search for the old machines resulted in the discovery of essential parts of both of the Hunt machines in a garret in Gold Street, New York City, where they had been thrown among a lot of rubbish recovered from a fire.

Hunt himself, like most inventors, was then working on other ideas and was satisfied that he had invented, built, and put into practical operation, a machine capable of doing mechanical sewing with speed and precision, and having sold the invention—as he had many others—for a mere trifle, felt at that time no further urge to manufacture it. He later bought back from Arrowsmith his entire interest

in the invention and in 1853 built a third machine after his original plans, for the demonstration of his principles of sewing in a famous suit for infringement of patent rights. It was characteristic of him that he was all the time too much occupied with turning out new inventions to pay any attention to the development of the old, or to make the necessary efforts toward securing for himself a fair share of the profits derived from them. It was his misfortune that although he was a great inventor who could conceive ideas and mold them into practical shape, he was otherwise as simple as a child and lacked sufficient business sense to lead to success. He usually made his contracts in a loose and careless manner, was reckless and extravagant in spending and always in want of money, so that his inventions were usually sold before they were patented. Hunt's machine was undoubtedly the pioneer of the present sewing machine. It was his misfortune that his brain was too full of other and later inventions to admit of his pursuing this one to a successful development and that he did not reap his share of the splendid rewards which were showered so lavishly upon others. Let us not for that reason deprive him of what he is justly entitled to claim, the credit of having been the inventor of the first sewing machine which contained all the elements of practical and commercial success.

ELIAS HOWE, JR.

How often it is that a chance remark falls upon receptive ears other than those to which the remark was addressed, and brings forth astonishing results. In Boston, in 1839, an undersized, curly-headed youth of 20, gravely listening to an argument over the operation of a knitting machine between two men and his employer in a machine shop, heard the latter say: "What are you bothering with a knitting machine for? Why don't you make a sewing machine"? "It can't be done," said one. "Oh, yes it can," said the owner of the shop; "I can make a sewing machine myself." "Well, you do it, Davis," said the other, "and I'll insure you an independent fortune." The emphatic assurance of the well-dressed, prosperous-looking speaker that a fortune was in store for the man who should invent a sewing machine greatly impressed the shy farm boy unused to city ways, who had already amused himself with inventing some slight improvements of appliances in the machine shop where he worked as an apprentice. There were other reasons, too, why such a trifling conversation should remain in his mind, for steady labor was not to his liking, and a kind of lameness which he had had since his birth frequently made his tasks painful.

He was not very proficient in his trade of machinist and not inclined to put forth much exertion. He was, however, of a thoughtful turn of mind and the conversation he had heard over the value of a sewing

machine set him to watching the process of sewing as performed by hand, and to wonder if there was a way to accomplish it by machinery.

This youth, Elias Howe, jr., born on his father's farm at Spencer, Mass., in 1819, had his attention directed at an early age to mechanics. There were a grist mill, a saw mill, and a shingle-cutting machine on the home place, but all of these and the farm together barely sufficed for the needs of the family of eight children.

When but 6 years old, Elias Howe worked with his brothers and sisters at sticking wire teeth into strips of leather to make cards used in the spinning of cotton. After "living out" for a year with a farmer in the neighborhood, he returned home to work in the mills there until he was 16. Then he obtained a learner's place in a factory in Lowell, Mass., making cotton machinery, until the financial panic of 1837 closed the shop and forced him to look for work again. Finally he found work in the shop of Ari Davis, an ingenious mechanic, where occurred the conversation already related.

When Howe was 21, and still a journeyman machinist, earning $9 a week, he married and before long there were three children to be fed and clothed out of his weekly wage. About the year 1843, the pressure of poverty and the fatiguing nature of his work, forced him to make earnest attempts to invent the machine which he had heard four years before would bring an independent fortune to the inventor. He wasted many precious months in endeavoring to copy the motions of his wife's arm when sewing, using a double-pointed needle with the eye in the middle. One day the idea came to him of using two threads and forming a stitch with the aid of a shuttle. By October, 1844, he had constructed a model which convinced him that he had a machine which would really sew. At this time he set up a lathe and a few tools in the garret of his father's house at Cambridge, Mass., and brought his family to the house, giving up his job as journeyman mechanic. He had his invention worked out in his head but these ideas could only really be tested by the construction of an accurately working model of metal. He was desperately poor and could barely provide the necessities of life for his family.

The money needed to purchase the raw materials for a working model that would put into concrete form his mental picture of a wonderful machine seemed beyond his reach. His earnestness, however, convinced a friend and former schoolmate, George Fisher, then a coal and wood dealer in Cambridge, of the feasibility of his project, and a partnership was drawn up for bringing Howe's invention into use.

By its terms George Fisher was to board Elias Howe and his family while Elias was making the model of his machine in Fisher's garret as a workshop, was to provide money for material and tools to the extent of $500, and in return was to be the owner of one-half

of the patent if the machine proved patentable. In December, 1844, the Howe family moved into Fisher's house and the shop was set up in the small, low garret. With the idea of his machine clearly in his mind and undisturbed by the need of daily laboring elsewhere to feed his family, Howe worked steadily on during the winter and by April, 1845, had sewed a seam on his machine. In July of that year he sewed on his model machine all the seams of two suits of wool clothes, one suit for George Fisher and one for himself.

This pioneer of the millions of sewing machines made since July, 1845, after crossing the ocean many times, and having been used as an irrefutable witness in many courts, can now be seen in the United States National Museum, at Washington, D. C., where it has been deposited by the grandson of Elias Howe, jr.

When Howe had finished his machine he found that his next problem was to convince others that it could sew and do the work as well as that performed by hand. Accordingly, he took his little machine to the Quincy Hall Clothing Manufactory in Boston and offered to sew up any seam that might be brought to him. For two weeks he sat daily in one of the rooms demonstrating his invention and finally challenged five of the swiftest seamtresses in the establishment to sew a race with the machine. Ten seams of equal length were prepared for sewing, one each was given to the five girls and the other five to be laid by the machine. The umpire testified that the five girls were the fastest sewers that could be found and that they sewed as fast as they could; Howe's machine, however, finished the five seams a little sooner than the five girls finished their five, and the work done by the machine was declared to be the neatest and strongest. In spite of this and similar demonstrations no one gave Howe an order for a sewing machine. When pressed for reasons some said they were afraid it would ruin all the hand sewers by throwing them out of work, some objected because the machine would not make the whole garment, others said the cost of the machine was too high as a large shirt maker would have to have 30 or 40 of them. Howe was not discouraged by these objections and set about to get his invention patented. He again shut himself up in George Fisher's garret for three or four months to make another machine for deposit in the United States Patent Office, as the patent laws then required. Late in the summer of 1846, a beautiful model and the required papers were ready for the Patent Office, and Elias and George took them to Washington. This model, Howe's second machine, is also exhibited in the National Museum, alongside of his original machine. It is a better made machine and shows several changes in unimportant parts. As soon as the patent was issued on September 10, 1846, Howe and his partner returned to Cambridge.

Without the enthusiasm of the inventor or the love given by him to his brain child, George Fisher became thoroughly discouraged. He had boarded the inventor and his family for nearly two years, had furnished the money needed to purchase the tools and materials for making the two sewing machines, he had met the expense of obtaining the patent and the trip of Howe and himself to Washington, representing in all an outlay of practically $2,000. Since no orders had been received from either garment makers or tailors for machines, Fisher did not see the slightest probability of the machine becoming profitable and regarded his advances of cash as a dead loss.

Elias Howe moved back to his father's house and the partnership with Fisher was practically at an end. But the inventor did not lose faith and decided to try to induce manufacturers in England to take up his invention. With a loan from his father, a third machine was made which Elias' brother, Amasa B. Howe, took with him to London in the steerage of a sailing packet. After a number of discouragements he made the acquaintance of William Thomas in his shop in Cheapside. This man claimed to employ 5,000 persons in the manufacture of corsets, umbrellas, valises, and shoes, and after studying the machine agreed to buy it. According to terms of this very one-sided bargain, Amasa Howe sold to William Thomas for £250 the machine he had brought with him from America (the third machine built by Elias Howe), and the right to use as many more in his own business as he wished. William Thomas proposed further to engage the inventor to adapt his machine to the making of corsets at a salary of £3 a week, and agreed to furnish workshop, tools, and materials. There was also an understanding that Thomas was to patent the invention in England and was to pay Howe £3 for every machine sold under the English patent. Thomas did patent Howe's invention but instead of paying him the promised royalty he colleeted for himself a tribute on all the sewing machines made in England, or imported into England, during the life of his patent. Elias Howe later estimated that the investment of £250 yielded Thomas a profit of a million dollars.

Amasa Howe returned to Cambridge, Mass., with Thomas' offer which Elias Howe reluctantly accepted, as there seemed no prospect of the sewing machine attracting attention in America, and the £250 were absorbed immediately by the needs of his family.

The brothers set sail for London, February 5, 1847, cooking their own provisions in the steerage. Elias took with him his precious first machine and his patent papers. William Thomas provided, as agreed, a shop and tools and advanced the passage money for the wife and three children of Elias Howe to join him in England.

After eight months of hard work the inventor succeeded in adapting his machine to the requirements of Thomas' business when the latter

began to make working conditions intolerable for Howe. The American resented his treatment which resulted in William Thomas discharging Elias Howe from his employment. A stranger in London, with a sick wife and three small children to support and no employment in sight was the disheartening predicament in which Howe now found himself. Through a chance acquaintance, a coach maker named Charles Inglis, he hired a small room for a workshop and with a few borrowed tools began to build his fourth sewing machine. He soon saw that he must reduce expenses or leave his machine unfinished, and decided to send his family home while he could, trusting that the machine he was building would provide the means for him to follow them.

He was so poor that he had to pledge some of his clothing to obtain a few shillings necessary to hire a cab to take his sick wife to the ship on the stormy night of her departure. After three or four months of hard labor his machine was finished and he looked for a customer. Finally a man was found who offered £5 for the machine if he could have time in paying for it. Howe was obliged to accept the offer and took the man's note for £5. His friend Inglis found a purchaser for the note at £4. In order to pay up his debts and pay his expenses back to America, Howe pawned his precious first machine and the patent papers from the United States Patent Office. To save cartage he took his baggage to the ship in a handcart and again took passage in the steerage along with his friend Charles Inglis.

Elias Howe landed in New York in April, 1849, after an absence from America of two years, with but half a crown in his pocket. Nearly four years had passed since the finishing of his first sewing machine and the small piece of silver was all he had to show for his work on that invention. He and his friend went to a cheap emigrant boarding house and looked for work in the machine shops, which he fortunately soon found. When news reached him that his wife was dying of consumption he did not have the money for the journey to Cambridge, but with the help of $10 from his father he was able to reach his wife's bedside before she passed away. In spite of his natural gaiety of disposition he was greatly downcast and looked like a man who had passed through a long and severe illness. However, he was now among friends who looked after his children and he was soon at work again as a journeyman machinist at regular weekly wages.

It is seldom that a man who makes a great invention is able to educate the public into using it. Neither Elias Howe, nor his friend George Fisher, could succeed in selling a machine which cost from $200 to $300 to build, and upon which the tailors looked with contempt or dread. Howe found to his surprise upon returning home from his experiences in London, that the sewing machine had become celebrated, though his part in its invention appeared

to have been forgotten. Several ingenious mechanics who had seen the Howe machine, or who had read of a machine for sewing, had turned their attention to inventing in the same field and sewing machines were being carried around the country and exhibited as a curiosity. Several machines made in Boston had been sold to manufacturers and were daily in operation. Howe found that these machines all infringed his patent rights by using devices which he had combined and patented. Though he was very poor the thought of all the suffering he and his family had endured while trying to introduce his invention determined him not to submit while others robbed him of his rights, and he began to prepare for war against the infringers. The first step was to get back from England his precious first machine and his patent papers. During the summer of 1849, the $100 necessary to redeem them was raised and intrusted to a friend who was going to London. The machine and papers were located, redeemed from pawn and returned to Howe within a few months. Howe wrote to the infringers of his patent, warning them to stop their manufacture and offering to sell them licenses to continue the use of his devices. All but one seemed willing to accept his proposition but that one pursuaded the others to resist and Howe was was soon forced to return to the courts for redress. With his father's help he began a suit, but soon discovered that money was required beyond the means of a poor journeyman mechanic. He endeavored to arouse the interest of George Fisher, who was still the owner of a half interest in the patent, but Fisher had had enough of the sewing machine and would not advance any more money. He was willing to sell his half of the patent for what it had cost him up to that time, and Howe looked around for someone to buy out Fisher's interest.

In February, 1851, George S. Jackson, Daniel C. Johnson, and William E. Whiting became joint owners with Howe of his patent rights, and helped him to procure witnesses in the furtherance of numerous suits. The next year a Massachusetts man named George W. Bliss was persuaded to advance the money needed to carry on the suits for infringement. This was done as a speculation, but so weak was his faith that he required as security against loss a mortgage upon the farm of the elder Howe. Elias's long-suffering parent again came to his rescue and the deal was completed.

While the suits were being carried on, Elias Howe found time to again engage in making sewing machines. Near the end of 1850 he was in New York looking after the construction of 14 of his machines in a shop on Gold Street, near which he opened a small office. Several machines were sold to a bootmaker in Worcester, several others were operated by garment manufacturers on Broadway, and one of the machines was exhibited at the fair held in the Castle Garden in October, 1851.

The infringers of Howe's patent were men of small means and could not put up much fight, but in August, 1850, Howe crossed swords with a man capable of carrying on a much more vigorous warfare than they. This man was Isaac Merrit Singer.

ISAAC MERRIT SINGER

This part of our story also begins in a machine shop in Boston. Lerow & Blodgett had patented a sewing machine on October 2, 1849, the peculiar feature of which was that the shuttle was driven entirely around a circle at each stitch. It was in some ways an improvement on the Howe machine, but the circular movement of the shuttle took a twist out of the thread at every revolution and the machine was hard to keep in running order. Several of these machines had been brought for repairs to the shop of Orson C. Phelps in Boston, where in August, 1850, their operation was watched by Isaac M. Singer who had shortly before patented a wood-carving machine. With the experience of a practical machinist, Singer criticized the clumsy working of the sewing machine, and when Phelps asked him how the defects could be overcome, Singer promptly said: "Instead of the shuttle going around in a circle I would have it move to and fro in a straight line, and in place of the needle bar pushing a curved needle horizontally I would have a straight needle and make it work up and down this way." Phelps assured him that if he could make a practical sewing machine he would make more money from it than from his carving machine. A recent boiler explosion in New York City had wrecked the machine shop where Singer's carving machine was being built and his machine was utterly destroyed. He was without funds to rebuild it and absolute poverty stared him in the face. The remarks of Phelps set him thinking and after considering the matter overnight he became satisfied that he could make the thing work. The next day Singer showed Phelps and George B. Zieber, a machinist working in the shop, a rough sketch of the machine he proposed to build. It contained a table to support the cloth horizontally, instead of a feed bar from which it was suspended vertically as in the Blodgett machine, a vertical presser foot to hold the cloth down against the upward stroke of the needle, and an arm to hold the presser foot and vertical needle-holding bar in position over the table. The story continues as told by Mr. Singer himself in a statement made during the progress of some litigation in which he was at one time engaged.

> I explained to them how the work was to be fed over the table and under the presser foot by a wheel having short pins on its periphery projecting through a slot in the table, so that the work would be automatically caught, fed, and freed from the pins, in place of attaching and detaching the work to and from the baster plate by hand as was necessary in the Blodgett machine.
>
> Phelps and Zieber were satisfied that it would work. I had no money. Zieber offered $40 to build a model machine. Phelps offered his best endeavors to

carry out my plan and make the model in his shop; if successful we were to share equally. I worked at it day and night, sleeping but 3 or 4 hours a day out of the 24, and eating generally but once a day, as I knew I must make it for the $40 or not get it at all.

The machine was completed in 11 days. About 9 o'clock in the evening we got the parts together and tried it; it did not sew; the workmen exhausted with almost unremitting work, pronounced it a failure and left me one by one.

Zieber held the lamp, and I continued to try the machine, but anxiety and incessant work had made me nervous and I could not get tight stitches. Sick at heart, about midnight, we started for our hotel. On the way we sat down on a pile of boards, and Zieber mentioned that the loose loops of thread were on the upper side of the cloth. It flashed upon me that we had forgot to adjust the tension on the needle thread. We went back, adjusted the tension, tried the machine, sewed five stitches perfectly and the thread snapped, but that was enough. At 3 o'clock the next day the machine was finished. I took it to New York and employed Mr. Charles M. Keller to patent it. It was used as a model in the application for the patent, the extension of which is now asked.

Starting with a borrowed capital of $40, this poor mechanic found that he was pursuing a difficult road. Discouragements and disappointments met him at every turn. Persons who had bought sewing machines on the strength of inventors' statements had been obliged to throw them aside as useless, so every man who pretended to have a real practical machine was considered an imposter. Singer found to his sorrow that whoever attempted to bring out a sewing machine was confronted with all the consequences of previous failures.

Blodgett, whose rotary shuttle machine had been the means of directing Singer's inventive powers to the field of mechanical sewing, told Singer that he was a tailor by trade and knew more about sewing than Singer possibly could. He advised Singer to give up the attempt to manufacture sewing machines and sell territorial rights instead, since even though the Blodgett machine had been the leading one on the market he felt assured that "sewing machines would never come into use." Three factories which he had established to use his sewing machines had failed. In spite of this kind of advice from all sides, this undaunted mechanic struggled on, fighting poverty, determined to force the public to recognize the fact that a practical sewing machine had actually been made. He borrowed a few hundred dollars from friends to enable him to manufacture machines in Boston, where, with Phelps and Zieber, he began work under the firm name of I. M. Singer & Co. The firm was gaining the attention of the public, when a new and formidable obstacle appeared. The news that Singer had made a machine that would actually do *continuous* stitching, the most conspicuous defect in the Howe machine, soon brought Elias Howe, jr., to his door with a demand that he pay $25,000 for infringement of the Howe patent, or quit the sewing-machine business. It did not take long for a man who had recently borrowed $40 to start his business, to decline the payment of $25,000

tribute, but neither was Singer disposed to give up his hard-won advantage without a fight. He soon found himself burdened with litigation which threatened to ruin him. About this time Singer secured the help of an acute legal mind in the person of Edward Clark, of New York, whose ability as a financier was hardly less marked. Although he contributed no money, Clark became an equal partner in the firm of I. M. Singer & Co., Phelps having been bought out some time before. Later Singer and Clark bought out Zieber.

Singer's success in developing a practical machine had encouraged other inventors and a number of other machines were brought out, some of them only obvious attempts at slight improvements on the Howe machine, but a number were fundamental inventions of a new type. Howe's patent of 1846, for the time being, made him a complete master of the situation and for several years he sued infringers right and left. The sewing-machine manufacturers, with the exception of the Singer Company, yielded to Howe and were carrying on their business under his licenses without interruption. I. M. Singer & Co. had resisted him single-handed from the very beginning, setting up in justification of their right to manufacture sewing machines, the claims of Walter Hunt, the New York inventor, that he had made a sewing machine, using an eye-pointed needle and a shuttle to form the lock stitch, previous to the year 1834. As Walter Hunt was unable to produce a complete machine made at that time and admitted that he had failed to apply for a patent on his invention, the courts decided that it was never completed in the sense of the patent law and therefore did not anticipate the patent granted to Howe. I. M. Singer & Co. submitted to the order of the court, for much damage was being done to their business by the competition of manufacturers who were working uninterruptedly under licenses from Howe, and in July, 1854, took out a license under the Howe patent, paying him $15,000 in settlement for royalties on machines made and sold prior to that time.

The decision of the court sustaining Howe's claims was made nine years after the completion of his first machine, and after eight years of the first term of his patent had expired. The patent, however, had been so little productive of revenue that Howe was able, in spite of the cost of the numerous suits for infringement he had started, upon the the death of his partner, George Bliss, to buy his half interest, and thus became, for the first time, the sole owner of his patent. This occurred just when it was about to yield an enormous revenue. His success in his suit against the Singer Co. made it easy to enforce his legal rights against others. In 1860 he obtained an extension of his patent for seven years, and though he again applied for another extension in 1867, claiming that he had received only $1,185,000, and that because of its value to the public he should receive at least $150,000,000, his second extension of the patent was denied.

The copartnership of Singer and Clark was continued until 1863, when a corporation was formed to continue the business. Singer withdrew from active work, receiving 40 per cent of the stock of the new company, and left America to make his home in Europe. Upon his death, 12 years later, his estate was appraised at $13,000,000.

Singer's original patent model is preserved in the National Museum. This type of machine, in use for many years, required less modification than any one of the earlier makes of sewing machines.

Isaac Singer was the first to furnish the people with a successfully operating and practical sewing machine. After the introduction of the Singer machine other inventors, with patents of earlier date, were forced to alter their machines to meet the approval of the public.

ALLEN BENJAMIN WILSON

One of the ablest of the early inventors in the field of mechanical sewing, and by far the most original, was Allen B. Wilson. This ingenious young man completed a practical sewing machine early in the year 1849 without ever having seen one and without having any knowledge of the work of Elias Howe, who was then in London.

In 1847, Allen Wilson, at 20 years of age, was working as a journeyman cabinetmaker in Adrian, Mich., far removed from any possible contact with the sewing-machine inventors of New England, when the idea first came to him of making a machine to sew. In a letter to a friend he describes his poverty at this time and the difficulties under which he worked. "I was in needy circumstances, earning but little more than enough to board and clothe me. I was taken sick early in the spring of 1847, with fever and ague, which greatly reduced me; I have never fully recovered from it."

Wilson had first begun the development of a needle and shuttle machine, but instead of using a shuttle pointed at one end and moving back and forth in a straight line, as had both Howe and Singer, he made a shuttle pointed at both ends and which moved in a curved path, forming a stitch at each forward and backward stroke. Before he had been granted this patent he was threatened with a lawsuit by the unscrupulous owners of an interest in another machine having a 2-pointed shuttle, unless he would convey to them half his interest in his patent when issued. Having no money to defend his right, and his partner, Mr. Chapin, being unwilling to advance any more, he consented to a compromise. About this time Allen Wilson made the acquaintance of Nathaniel Wheeler, a manufacturer of buckles and other small metal wares at Watertown, Conn. Mr. Wheeler saw Wilson's sewing machine in New York City, and made a contract with the firm controlling the patent to build 500 machines for them. He also engaged Wilson to go with him to Watertown to perfect the machine and superintend its manufacture. In the meantime, Allen

Wilson had thought out the plan of a substitute for the shuttle, the rotary hook, a marvelous piece of ingenuity. He showed Mr. Wheeler his model, who became so convinced of its merits that he determined to develop the new machine and leave Wilson's first shuttle machine to those who, by fraud, had become the owners of it. This last firm possessed neither the mechanical nor business ability to put it properly on the market, and in a few years the original patent was purchased by the Wheeler & Wilson Manufacturing Co.

Wilson now bent all his efforts to improving his rotary hook which was a new departure from all previous ideas of sewing, and was described in his second patent, issued on August 12, 1851. It is a remarkable coincidence that on the same date a patent was granted to Isaac M. Singer for his first machine, which, with its improvements, was for many years the most formidable competitor of the Wheeler & Wilson machine.

Wheeler, Wilson & Co. at once began the manufacture of the new machines. The sewing machines which had been previously patented and sold to the public were so difficult to operate and so impracticable that there was much distrust of all such devices and but few were willing to even try them. With the assistance of his wife to operate the machine, Wilson demonstrated to O. E. Winchester, later the head of the Winchester Repeating Arms Co., but at that time a large manufacturer of shirts in New Haven, Conn., its ability to neatly and rapidly make a shirt. Mr. Winchester was so agreeably surprised with the quality of the work that he agreed to take some machines on trial. In the same way machines were left for trial in Troy, N. Y., Boston, and Philadelphia. Soon the business was on a substantial basis and in October, 1853, a stock company was formed under the name of the Wheeler & Wilson Manufacturing Co.

Wilson's fourth patent, the universally used 4-motion feed, was issued on December 19, 1854. This, with the rotary hook and the stationary circular disk bobbin, the subjects of his second and third patents in 1851 and 1852, completed the essential features of Wilson's machine, original and fundamentally different from all other machines known at that time.

The first crude models, whittled out of mahogany by Allen B. Wilson between 1847 and 1849, which clearly show the development of his ideas, and the original models deposited in the Patent Office establishing the claims made in his first three patents, are now preserved in the National Museum. The model representing the third patent, that of June 15, 1852, is a beautifully made, compact little machine, weighing but 6½ pounds, and contrasting greatly with the clumsy, heavy Singer models of that time which weigh over 55 pounds.

Having applied his inventive genius to starting the business, Mr. Wilson was at his own request, upon the reorganization of the firm

in 1853, released from active service or further responsibility for the company. His ill health, and the effects of his early struggles and a keenly sensitive nervous temperament made it desirable for him to be relieved of the daily routine of the business. During his leisure he found time to explore other fields of invention, among which were cotton-picking machines, photography, and illuminating gases.

Wilson did not receive a proper reward for his great inventions, especially when this is compared with the earnings of Howe and Singer, whose inventions were mechanically much inferior. In his petition to Congress in 1874 for a second extension of his three patents, he stated that he had not received more than his expenses during the 14-year term of his original patent and that because of his poverty he had been compelled to sell a half interest in his patent for $200. He also stated that for the 7-year term of the extension of his patent he had only received $137,000. These statements were verified by his original partner.

JAMES EDWARD ALLEN GIBBS

The invention of the first practical single chain-stitch sewing machine came about through the curiosity of a young native Virginian having a mechanical turn of mind. James Gibbs had been helping his father build wool-carding machines, but the burning of his father's mill and the competition of large factories led him to turn to carpentering to provide for his family. It was in 1855 that his attention was first attracted to sewing machines by seeing a plain woodcut of a Grover and Baker machine in a newspaper advertisement. This picture showed only the upper part of the machine which left the course of the needle and the manipulation of the thread under the cloth a mystery. There was nothing in the cut to show that more than one thread was used and it at once excited his curiosity to know how the thing could possibly sew. His effort to solve the puzzle is best told in his own words:

> As I was then living in a very out of the way place, far from railroads and public conveyances of all kinds, modern improvements seldom reached our locality, and not being likely to have my curiosity satisfied otherwise, I set to work to see what I could learn from the woodcut, which was not accompanied by any description. I first discovered that the needle was attached to a needle arm, and consequently could not pass entirely through the material, but must retreat through the same hole by which it entered. From this I saw that I could not make a stitch similar to handwork, but must have some other mode of fastening the thread on the underside, and among other possible methods of doing this, the chain stitch occurred to me as a likely means of accomplishing the end. I next endeavored to discover how this stitch was or could be made, and from the woodcut I saw that the driving shaft which had the driving wheel on the outer end, passed along under the cloth plate of the machine. I knew that the mechanism which made the stitch must be connected with and actuated by this driving shaft. After studying the position and relations of the needle and shaft with each other, I conceived the idea of the

revolving hook on the end of the shaft, which might take hold of the thread and manipulate it into a chain stitch. My ideas were, of course, very crude and indefinite, but it will be seen that I then had the correct conception of the invention afterwards embodied in my machine.

Having no further interest in view than to satisfy his curiosity as to how sewing by machinery could be done he gave the matter no further attention or thought until January, 1856. Then while on a visit to his father in Rockbridge County, Va., he happened to go into a tailor's shop where there was a Singer sewing machine working on the shuttle principle. He was much impressed with the ability of that machine, but thought it entirely too heavy, complicated, and cumbersome, and also that the price was exorbitant. He then set to work in earnest to produce a more simple, cheap, and useful machine. His family was dependent upon his daily labor for support, so that Gibbs had very little time to spare for experiments, and could work on his invention only at nights and in bad weather. He was at a great disadvantage for want of tools and materials, having to make his own needles and parts of wood. By the end of April, 1856, he had so far completed his model as to interest his employers in his invention and induce them to furnish the money necessary to patent it and develop the machine. Gibbs then came to Washington, where he examined the models in the Patent Office and some of the sewing machines then on the market. He took his machine to Philadelphia and showed it to James Willcox, who was then engaged in building models of new inventions. Mr. Willcox and his son Charles were favorably impressed with the invention and it was arranged that Gibbs and Charles Willcox should work together in developing any possible improvements, using for this purpose a small room in rear of the shop. After taking out some minor patents he obtained his most important one on June 2, 1857. The original models of these early efforts are preserved in the National Museum. This association with James Willcox led to the formation of the Willcox & Gibbs Sewing Machine Co., which has certainly done its share in the development of the sewing machine art.

During the Civil War, Gibbs was in sympathy with the South, while his partner Willcox supported the North. Owing to poor health, Gibbs took no active part in the fighting, occupying himself in the manufacture of saltpeter for gunpowder. At the close of the war he called on James Willcox at Philadelphia and was shown by his faithful partner that his interests had not suffered during his absence.

Raised among the hills of the Shenandoah Valley, James E. A. Gibbs never forgot his love for Virginia and after he became prosperous, he bought a farm in his native county, where he lived the latter part of his life.

WILLIAM O. GROVER

Something of the origin of another and still different type of sewing machine which was developed about the time of the Wilson and Singer machines forms a necessary part of our story. This was the double-locked chain-stitch machine invented by William O. Grover, a Boston tailor. Though the machines which he had seen were not very practical he came to the conclusion that the sewing machine was going to revolutionize the tailoring trade, and in 1849 began to experiment with the idea of making an improved stitch. One plan was to invent a machine which would take its thread directly from the spools and do away with the need of rewinding the under thread upon bobbins. After a great deal of experimenting he finally discovered that two pieces of cloth could be united by two threads interlocking with each other in a succession of slip knots, but the building of a machine to do this proved to be a very difficult task. It is remarkable that during his experiments he did not discover the single thread chain stitch, later worked out by Gibbs, as up to this time this stitch had not been heard of by any sewing-machine inventors in America. It is probable that, working on the assumption that it was absolutely necessary to use two threads, the idea of using one thread could not find room to develop in his brain.

Grover's patent was issued, February 11, 1851, and the original model is shown in the collection of sewing machines in the National Museum. Mr. Grover associated with himself in the development of the business another Boston tailor, William E. Baker, and upon a reorganization of the company soon after under the name of the Grover & Baker Sewing Machine Co., took into the firm Jacob Weatherill, mechanic, and Orlando B. Potter, lawyer. This company built in Boston a most complete factory for the production of the machines. Mr. Potter, the president of the company, had, through his ability as an attorney, secured a one-third interest in the business without an investment at the start, and now obtained patents for Grover's inventions and managed all the lawsuits brought against the company. He was the promoter of the first trust of any prominence formed anywhere. It was known as the "sewing-machine trust," or more popularly, the "combination."

THE SEWING MACHINE COMBINATION

The celebrated suit between Elias Howe, jr., and I. M. Singer & Co., was decided by Judge Sprague of Massachusetts in the year 1854, a verdict being rendered in favor of Howe. This verdict was of the greatest importance, for it covered the use of an eye-pointed needle in a sewing machine. Howe's success in the suit against Singer was followed soon after by a verdict against the Wheeler & Wilson Co.,

Grover & Baker Co., and other infringers of Howe's patent. These decisions put Howe in absolute control of the sewing-machine business and he made arrangements with the various companies to pay him $25 for every machine sold. From this enormous royalty he derived a large revenue for some time. However, Howe did not have entirely easy sailing, and more legal battles took place. While none of the other inventors' machines could sew without using the eye-pointed needle, patented by Howe, the latter's machines were in many ways so badly handicapped, especially by his slow and clumsy method of feeding the cloth, that they were of no practical use. When he attempted to improve his machine so as to overcome these defects, Howe got into further litigation with I. M. Singer & Co., the Wheeler & Wilson Co., and the Grover & Baker Co., for infringing mechanical patents which were owned by them. The quarrels over patent rights were by no means confined to Howe, as each individual company was suing all of the others on one claim or another. Finally, Orlando B. Potter, president of the Grover & Baker Co., conceived the idea of combining the various interests and pooling all the patents covering the essential features, which would enable them to control the sewing-machine industry, instead of continually fighting and trying to devour one another. He pointed out that while Howe and the three large companies then suing one another controlled all the basic patents, the pending lawsuits if carried to a conclusion, might be disastrous to all of them. His argument was convincing and thus was formed the "combination" which for several years was the terror of all unlicensed manufacturers. Besides Howe, the three companies which were parties to the combination, I. M. Singer & Co., the Wheeler & Wilson Co., and the Grover & Baker Co., had all begun business about the same time, and the main patents under which they were working had been granted between November 12, 1850, and August 12, 1851.

At first Howe did not take very kindly to the idea of the combination as he felt that he had the most to lose by joining it. He insisted as one of the conditions of his coming into the plan that at least 24 licenses to manufacture sewing machines be issued. By the terms of the agreement he was to share equally with the other three parties in the profits of the combination, and in addition was to receive a royalty of $5 for each machine sold in the United States, and $1 for each machine exported.

It is estimated that Howe received in the form of royalties as the result of this agreement not less than $2,000,000 from the business of the combination.

The three other concerns contributed their various patents to the combination, and the price for a license to manufacture was set at $15 per machine, with the condition that no license could be

granted without the consent of all four parties. It was also agreed that a portion of the license fees was to be reserved as a fund out of which to pay the cost of prosecuting infringers.

This arrangement enabled manufacturers to continue making machines by the payment of only one license fee to the combination, and anyone who had a good machine that was not an offensive imitation of that of some other licensed manufacturer was granted a license. There was no pooling of any other interest in the combination excepting that of patents; each company retained the right to make a certain machine and aimed to so improve and perfect its own particular machine that it would be selected instead of others.

The most important patents contributed to the combination were the following:

1. The combination of the grooved, eye-pointed needle and a shuttle, by Elias Howe, jr.
2. The 4-motion feeding mechanism, by Allen B. Wilson.
3. The continuous wheel feed, the yielding presser foot, and the heart-shaped cam as applied to moving the needle bar, by Isaac M. Singer.
4. The basic patent covering a needle moving vertically above a horizontal work plate, a yielding presser resting on the work, and a "perpetual" or continuous feeding device, which had been issued to John Bachelder on May 8, 1849, and afterwards purchased by Singer and his partner Clark.

The Grover & Baker Co., controlled several patents of importance which were contributed to the combination, but its most important claim for admission was the fact that Mr. Potter had promoted the scheme.

When Howe's patent was renewed in 1860 the general license fee was reduced from $15 to $7, and Howe's special royalty from $5 to $1.

The combination continued in existence with Howe as a member until the expiration of the extended term of his patent in 1867, and was then continued by the other members until 1877, when the John Bachelder patent expired. This patent had been twice extended, so that it ran for 28 years. The fundamental principles of the sewing machine were now no longer controlled by any one, the beneficial open competition of the smaller manufacturers was made possible, and an enormous reduction of prices resulted. Many important and radical improvements appeared in quick succession, which greatly multiplied the usefulness of the sewing machine.

CONTRIBUTIONS OF THE PIONEER INVENTORS

Leaving for the time these accounts of the struggles of pioneer inventors in the field of mechanical sewing to prove the practicability of their ideas, let us see what were the real achievements of these men. While the drawings of Saint's sewing machine, which was patented in England in 1790, show the overhanging arm, the up and down movement of the needle, the horizontal bed or plate to support the

sewing, and a continuous thread, it is doubtful if any but the experimental machine was ever made, so that nothing was done by this inventor toward making his invention useful to mankind.

To Barthelemy Thimonnier, however, belongs the credit for having been the first to put the sewing machine to practical and public use. While his machine, patented in France in 1830, adopted some of the features of Saint's machine, Thimonnier put his machine to a practical and useful purpose, and had it not been for the opposition of the very class of people who have since been benefited by it he would undoubtedly have found profit in the enterprise.

To Walter Hunt belongs the honor of having invented the needle with the eye in the point and having first combined the shuttle and the eye-pointed needle to make the lock stitch; and this was as early as 1832, or shortly thereafter, while Thimonnier had only just succeeded in sewing with a machine, nor can this honor be taken away from Hunt because he neglected to pursue his invention and introduce the sewing machine to the world.

To Elias Howe must be given the credit for the first introduction of the sewing machine to the prominent position which it now occupies. There is no denying the fact that it was due to his persistency that most of the principles of good sewing were demonstrated by his patent. As one writer has expressed it: "With inventive abilities inferior to those of Walter Hunt he (Howe) had an adaptness to follow out a single object persistently, and he reaped the field." The combination of an eye-pointed needle and shuttle using two continuous threads to produce a lock stitch was a feature of the embroidering machine invented by John Fisher in England in 1844, but the English had never improved upon the idea nor had even applied it to a machine to do ordinary sewing prior to the sale of Howe's third machine to William Thomas for use in his corset factory. Although the eye-pointed needle was invented by Hunt and used by him in 1834, and was patented in England in 1841 as part of a glove-stitching machine using the chain stitch, nevertheless Howe's machine was the first to be patented anywhere having a needle with the eye in the point which carried a continuous thread and made a lock stitch.

Howe's machine was capable of sewing a seam well but it must be admitted that the machine was far from perfect. As constructed it could never have come into use as a labor-saving machine for family use, for it could not sew anything but straight seams, and such seams could not be longer than the baster plate.

Of all the pioneers of sewing machine invention Allen B. Wilson was decidedly the most original in his ideas. His devices were unique and lasting in their usefulness. No sewing-machine device except the eye in the point of the needle has come into such universal use as his 4-motion roughened-surface feed. The vast majority of the sew-

ing machines made in the world to-day use the 4-motion feed. It was one of the strongest patents of those held by the famous sewing machine combination, and enabled that famous monopoly to defy all comers until its expiration.

When Wilson found that the idea of a double-pointed shuttle, although original with him and used in his first patent, was claimed by the owners of a patent granted to John A. Bradshaw in 1848, he applied his inventive genius to discover another way to sew. These efforts resulted in the development of the revolving hook for forming a lock stitch between an upper and a lower thread, an invention involving the use of entirely different mechanical principles. While the shuttle system of sewing has been arranged and changed in a thousand different ways, the revolving hook system remains in principle the same as Allen B. Wilson devised and left it. He not only contributed to the history of the sewing machine one of the most important devices common to all systems of machine sewing, but he was the author of a separate and entirely original system of his own.

A proof of the fundamental importance of Wilson's contributions is seen by the fact that a sewing machine embodying the form and principles used in the first type of machine manufactured by the Wheeler & Wilson Co. in 1852 is made and used by its successor to-day—77 years later.

To Isaac Singer should be given the credit for developing the first real practical sewing machine for domestic use. While the yielding vertical presser foot to hold the work on the work table, which is in universal use to-day, and the development of the wheel feed, an important feature of some special machines for factory use, were contributed by Singer in his first machine, his real service was in bringing the sewing machine into general use. When the competition of Singer's machine began to be felt, inventors of machines of an earlier date were compelled to modify their inventions and adapt them to meet practical conditions and to please the public. Later Singer himself was compelled to do the same thing and changed materially the heavy cumbersome form of his earlier type to meet the competition of the smaller, lighter, and easier running Wheeler & Wilson machine.

The principles of William Grover's double-thread chain-stitch machine, while no longer used in the present-day sewing machines built for domestic sewing, are very extensively employed in the machines built for all kinds of manufacturing purposes, especially those for making underwear, garments, sewing bags, and shoes.

THE SEWING MACHINE IN THE EARLY DAYS

The early efforts to construct a machine to take the place of the human arm and fingers were met with the indifference of the general public, but certain groups of workers with the needle saw in these

inventions a menace to their crafts, and endeavored to destroy them wherever they appeared. Another portion of the public was amused at the claims made for the freak "Yankee" machines and were curious enough to pay good money to see the "contraptions" exhibited in side shows.

One of Barthelemy Thimonnier's wooden machines was sent by him from France to his friend Charles Magnin in England to be shown at the Crystal Palace Exhibition held in London in 1851. It was exhibited by Magnin in his own name and received no notice whatever. There were exhibited at the Crystal Palace at the same time several English so-called sewing machines and one American machine, which had been patented by Morey and Johnson of Boston on February 6, 1849. While no notice was taken by English writers on science or technology of the few clumsy instruments catalogued as sewing machines which were shown at the "great exhibition of the world's industry," these machines did attract the attention of an astonished reporter for an important Italian newspaper. The following paragraph is a translation from an article in the Giornale di Roma, giving its readers a brief summary of American eccentricities in the Crystal Palace:

A little further on you stop before a small brass machine, about the size of a quart bottle; you fancy it is a meat roaster; not at all. Ha! ha! It is a tailor! Yes, a veritable *stitcher*. Present a piece of cloth to it; suddenly it becomes agitated, it twists about, screams audibly—a pair of scissors are projected forth—the cloth is cut; a needle set to work, and lo and behold, the process of sewing goes on with feverish activity, and before you have taken three steps a pair of *inexpressibles* are thrown down at your feet, and the impatient machine, all fretting and fuming, seems to expect a second piece of cloth at your hands. Take care, however, as you pass along, that this most industrious of all possible machines does not lay hold of your cloak or greatcoat; if it touches even the hem of the garment it is enough—it is appropriated, the scissors are whipped out, and with its accustomed intelligence the machine sets to work, and in a twinkling another pair is produced of that article of attire, for which the English have as yet been able to discover no name in their most comprehensive vocabulary.

In the United States in the meantime more serious attention was being paid to the new inventions which promised so well to lessen the labor of the needleworkers. The early issues of the Scientific American devoted considerable space to a description of each new sewing machine that appeared. From the issue of July 17, 1852, which told of the achievements of Allen B. Wilson, the following prophecy is quoted:

* * * When we look at the progress made in sewing machines, we expect them to create a social revolution, for a good housewife will sew a fine shirt, doing all the seams in fine stitching, by one of Wilson's little machines in a single hour. The time thus saved to wives, tailors, and seamstresses of every description is of incalculable importance, for it will allow them to devote their attention to other things, during the time which used to be taken up with dull seam sewing. Young ladies will have more time to devote to ornamental work (it

would be better for them all if they did more of it), and families in which there are a number of children, which require a continual stitching, stitching, in making and mending from morning till night, will yet be blessed by the improved sewing machine.

The sewing machine is but on the threshold of its career; it is but partially known and applied in our country. Private families know nothing about its use, and shoemakers and saddlers have not yet tested its benefits. Mr. Wilson informs us that he is about to make one that will sew boots and shoes with a rapidity that will astonish all the sons of St. Crispin. We suppose that, in a few years, we shall all be wearing shirts, coats, boots, and shoes—the whole habiliments of the genus homo—stitched and completed by the sewing machine. We suppose there are now fully 200 sewing machines in operation in New York City.

CHANGING CONDITIONS OF LATER TIMES

The effects on the economic life of the people and changes wrought in the home due largely to the invention and development of the sewing machine have been the theme of many addresses. The following quotation from an address made by Robert S. Taylor before the Patent Centennial Celebration in Washington, April 10, 1891, will serve as an example:

> It is too soon yet to estimate the full effect of the sewing machine upon human life and destiny. It ushered in an epoch of cheap clothes, which means better clothes for the masses, more warmth, more cleanliness, more comfort. * * * The indirect consequences of the invention of the sewing machine reach farthest beyond our ken. Time was when half the human race were occupied chiefly in making clothes. When the machines took that avocation away from them they turned to other employments. The invasion of all occupations by women and the sweeping changes which have taken place in their relations to the law, society, and business can be ascribed in large measure to the sewing machine.

The report of the United States Centennial Commission of the International Exhibition held in Philadelphia, 1876, contains an exhaustive account of the development of the type of sewing machines used in the homes of the people, the family sewing machines. An article of the same scope was prepared for the committee on awards of the World's Columbian Exposition, held in Chicago, 1893. In this but little is said concerning improvements made in machines of the family type between 1876 and 1893, but it describes the great strides made in developing factory machines for special purposes.

In spite of the widespread equipping of American homes with electric labor-saving devices, which now include the electrically driven sewing machine, the removal of so many domestic industries from homes to factories is having its effect on this "servant in the house."

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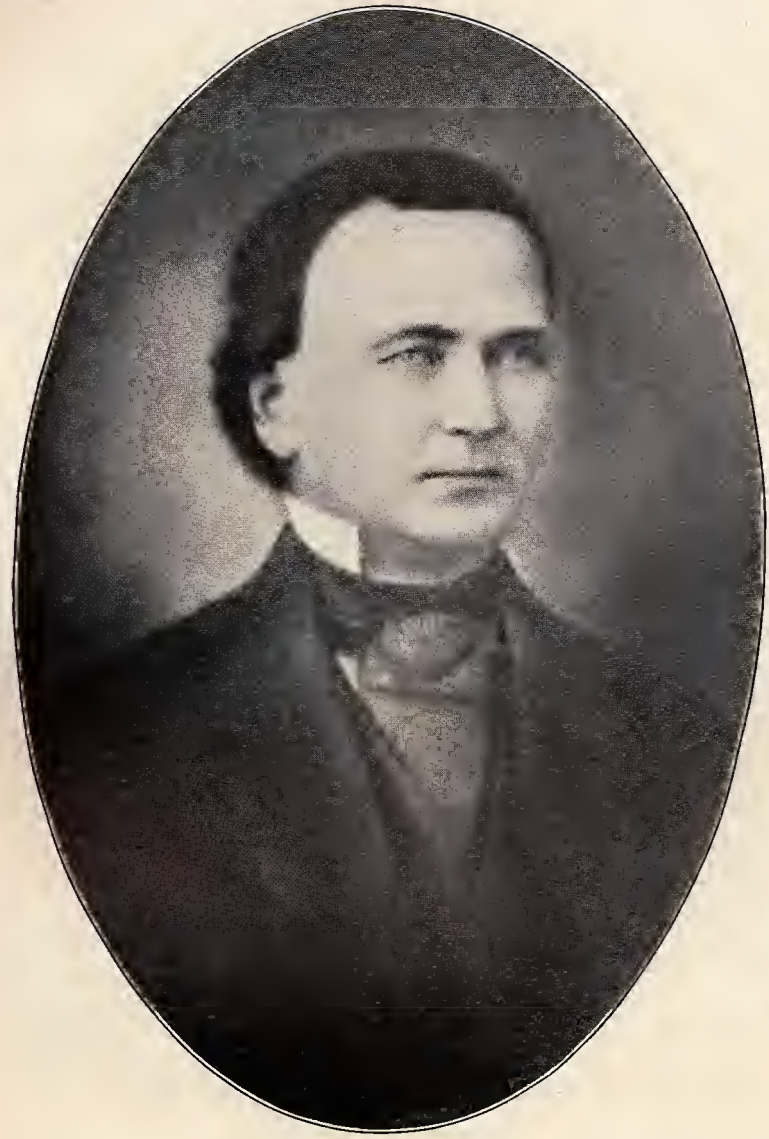

WALTER HUNT

Photographed from a daguerreotype in the possession of his great-grandson, Clinton N. Hunt.

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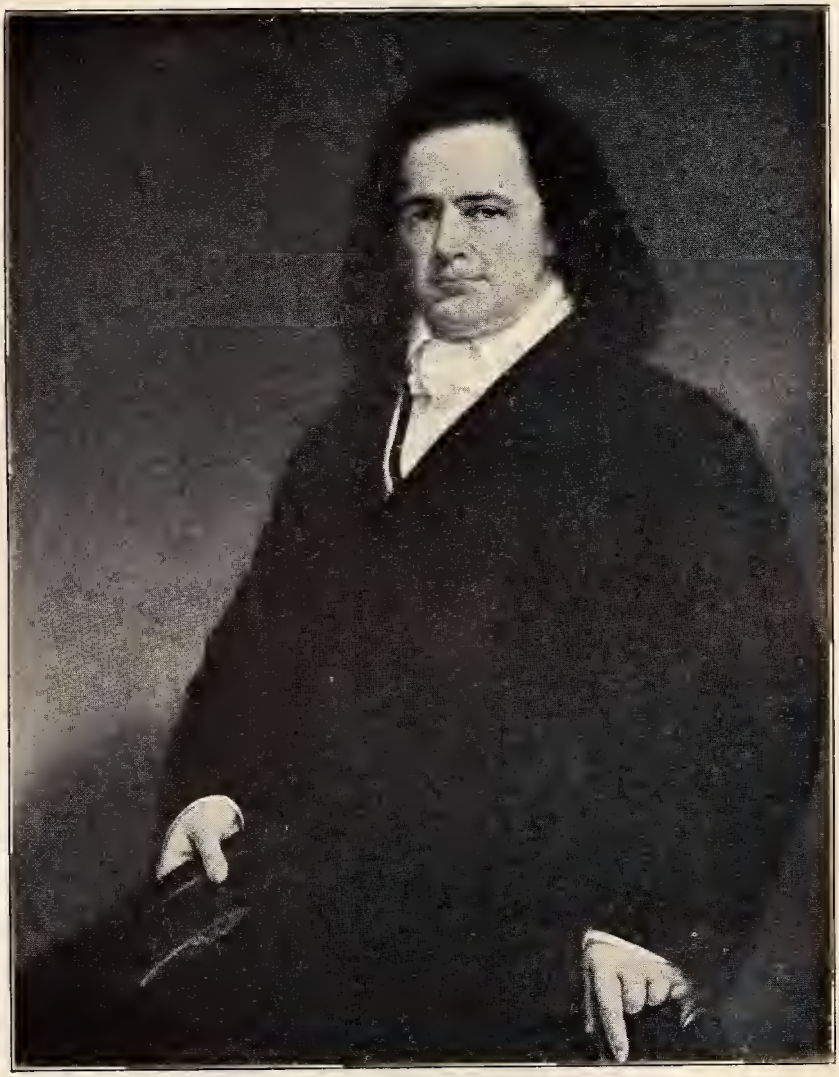

ELIAS HOWE, JR.

Photographed from the oil painting presented to the United States National Museum by his grandson, Elias Howe Stockwell.

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ISAAC MERRIT SINGER

Photographed from a charcoal drawing in the offices of the Singer Manufacturing Co., Elizabethport, N. J.

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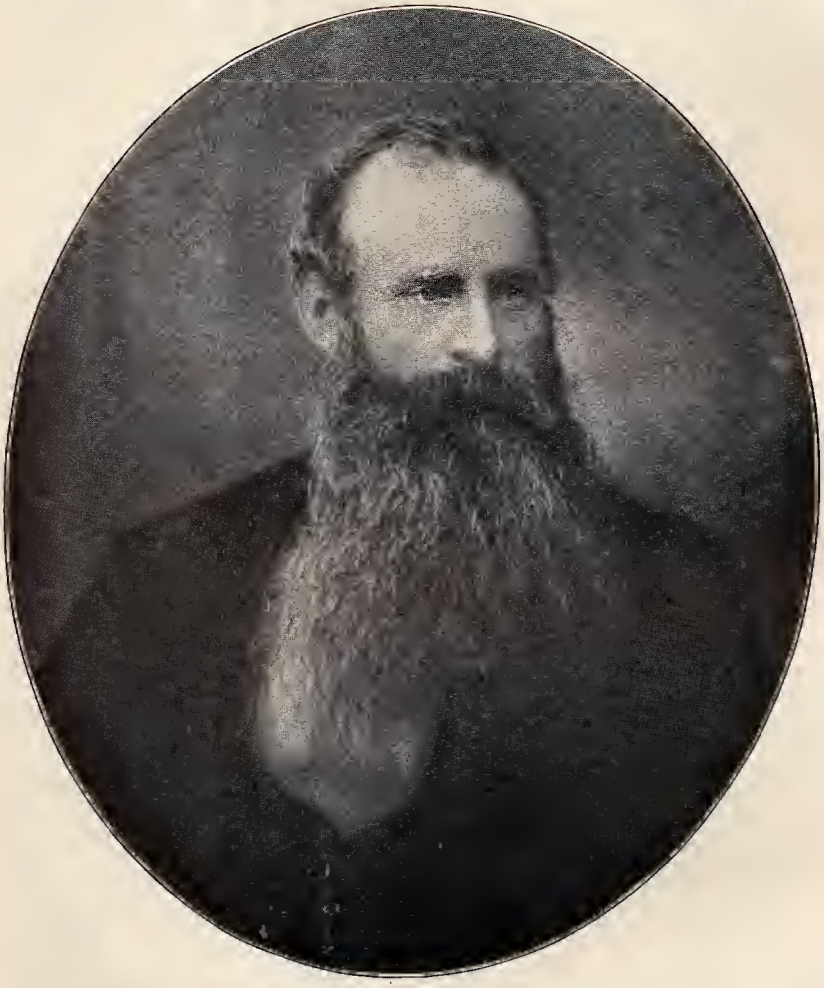

ALLEN BENJAMIN WILSON

Photographed from a drawing in the offices of the Singer Manufacturing Co., Bridgeport, Conn.; formerly owned by the Wheeler & Wilson Mamufacturing Co.

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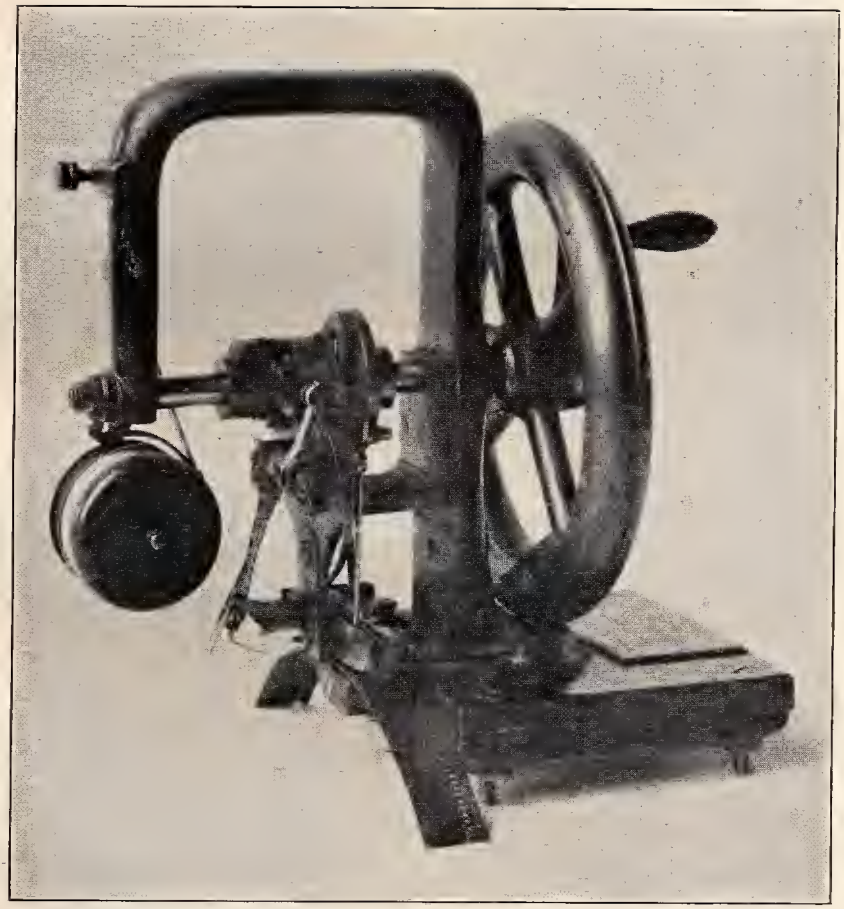

ORIGINAL SEWING MACHINE

Made by Elias Howe, jr., in 1845, and taken by him to England to interest manufacturers in his invention.

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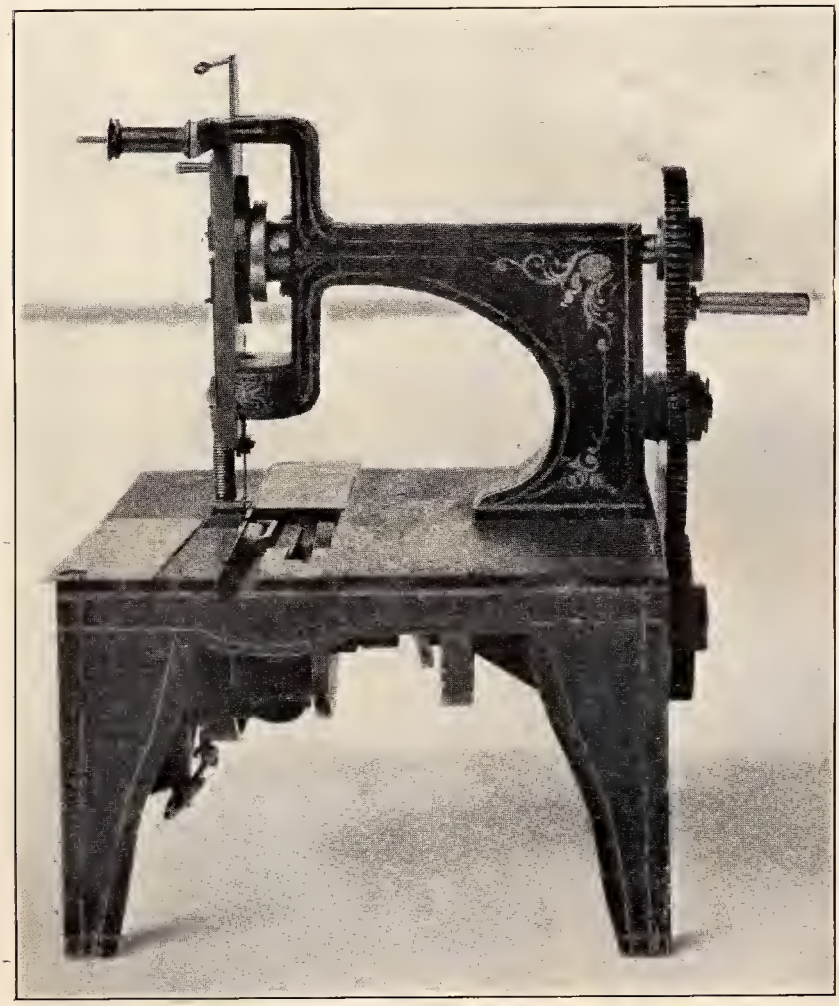

ORIGINAL MODEL OF UNITED STATES PATENT NO. 8294, ISSUED TO ISAAC M. SINGER. AUGUST 12, 1851

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ILLUSTRATION OF SINGER SEWING MACHINE PUBLISHED IN 1853

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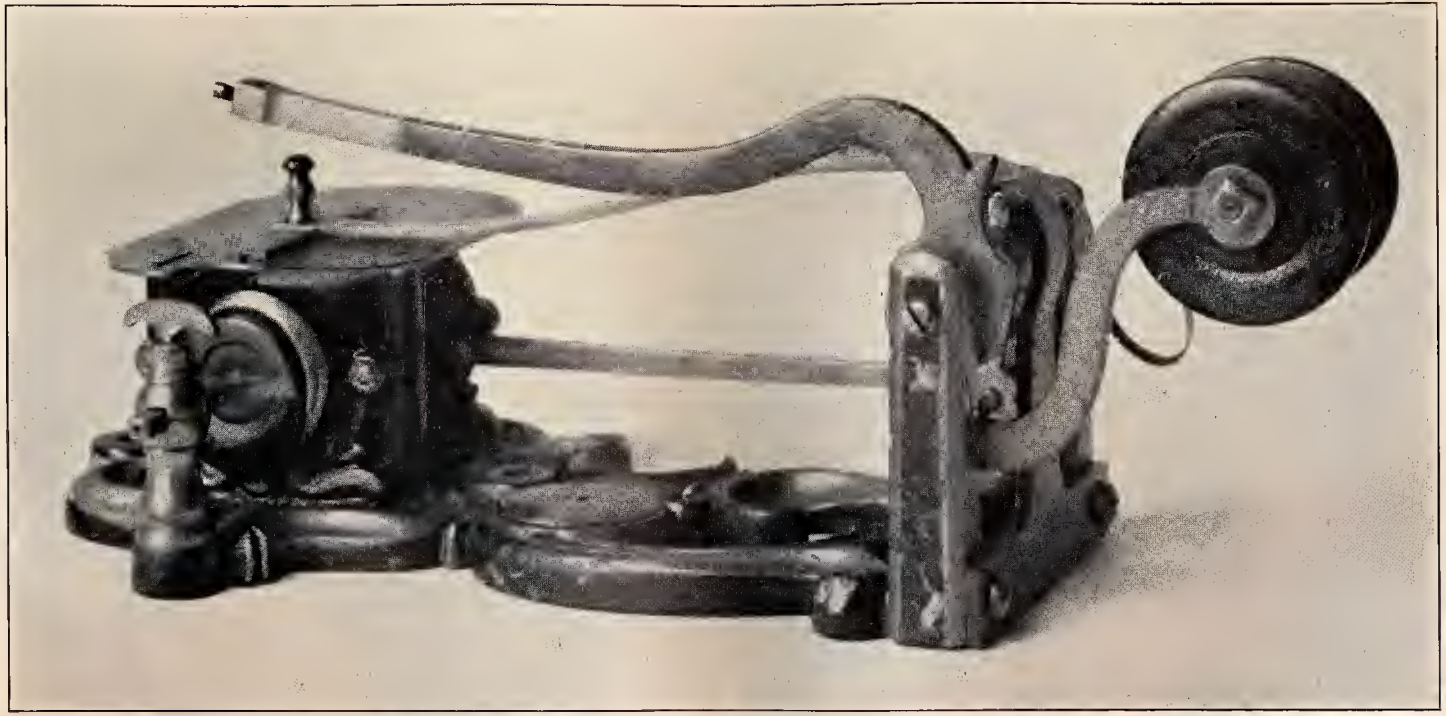

ORIGINAL MODEL OF UNITED STATES PATENT NO. 9041, ISSUED TO ALLEN B. WILSON, JUNE 15, 1852

Wilson's third patent, embodying his famous 4-motion cloth-feeding device.